



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/810,701

03/29/2004

Takeo Ohsaka

Q80771

9046

65565 7590 04/03/2009
SUGHRUE-265550
2100 PENNSYLVANIA AVE. NW
WASHINGTON, DC 20037-3213

EXAMINER

JOYNER, KEVIN

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

04/03/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/810,701	Applicant(s) OHSAKA ET AL.	
	Examiner KEVIN C. JOYNER	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2 and 5-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 5-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

FINAL ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2 and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Merk et al. (U.S. Patent No. 6,387,238) in view of Tennakoon et al. (U.S. Patent No. 6,949,178).

Regarding claim 1, Merk discloses a method for the sterilizing/cleaning of an object with an aqueous solution of peroxide (column 12, lines 49-53), and a method for the electrolytic synthesis of peracetic acid (column 3, lines 29-40) which comprises electrolytically synthesizing peracetic acid from an acid and an oxygen-containing gas as starting materials, said step of electrolytically synthesizing peracetic acid (regarding claim 5) comprising:

Providing an electrolytic cell (10) comprising an anode chamber (12) including an anode (16), a cathode chamber (14) including a gas cathode (18), a catholyte inlet and a catholyte outlet, and a membrane (20) separating the anode and cathode chambers (column 4, lines 41-64; column 5, lines 24-34; column 8, lines 64-66),

Supplying an oxygen-containing gas to the cathode chamber (column 5, lines 24-28), supplying an aqueous electrolyte containing acetic acid and/or an acetate to the

Art Unit: 1797

cathode chamber (column 5, lines 42-45; column 6, lines 11-20), and applying a voltage across the anode and the cathode to thereby electrolytically synthesize a peracetic acid-containing aqueous solution (column 5, lines 13-21), and

Contacting the object with the peracetic acid-containing aqueous solution (column 11, lines 54-60). More specifically, the peracetic acid precursor is added before the formation of the peroxide species (column 8, lines 54-55). The peroxide species is formed by the voltage sent to the cathode and anode that simultaneously reacts with the peracetic acid precursor to form the peracetic acid solution, and wherein the peracetic acid solution is formed inside the cathode chamber and supplied directly from the chamber to a decontamination system via a fluid line (89) as disclosed in column 11, lines 56-59. Thus, a voltage is applied across the anode and the cathode to electrolytically synthesize a peracetic acid-containing aqueous solution.

Merk does not appear to disclose a particular configuration comprising a particulate solid acid catalyst comprising a polymer resin filling a space between the gas cathode and the membrane, or said configuration further comprising the anode in contact with the membrane. Tennakoon discloses a method for the electrolytic synthesis of peracetic acid which comprises electrolytically synthesizing peracetic acid from the acetic acid and/or acetate and an oxygen containing gas as starting materials in the presence of a solid acid catalyst in column 12, lines 19-47. Tennakoon continues to disclose an electrolytic cell comprising an anode chamber including an anode (110 & 112), a cathode chamber including a gas cathode (134 & 136), a membrane (120) separating the anode and the cathode chambers, and a particulate solid acid catalyst

Art Unit: 1797

(132) comprising a polymer resin (column 4, lines 42-47; column 7, lines 25-39) filling a space between the gas cathode and the membrane in a manner wherein the anode is in contact with the membrane (column 3, lines 65-68) as shown in Figures 1 and 2.

Tennakoon also discloses that the solid acid catalyst is provided in the electrochemical cell in order to provide a catalyst for the reaction that eliminates the need for an aqueous corrosive acid catalyst (column 2, lines 40-61). The reference continues to disclose that such a configuration increases production rates of the aqueous solution as well as reduces the potential for introducing the toxic constituents (column 3, lines 31-68). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the electrolytic cell of Merk to include the particular configuration of Tennakoon comprising a particulate solid acid catalyst comprising a polymer resin filling a space between the gas cathode and the membrane, wherein the anode is in contact with the membrane in order to increase production rates of the aqueous solution and reduce the potential for introducing the toxic constituents.

Merk also does not appear to disclose that the component utilized with the oxygen containing gas in the process is acetic acid and/or acetate. However, it is conventionally known in the art of electrolytic synthesis to use acetic acid and/or acetate to produce peracetic acid. Tennakoon discloses one example of this teaching in a method for the electrolytic synthesis of peracetic acid which comprises electrolytically synthesizing peracetic acid from the acetic acid and/or acetate and an oxygen containing gas as starting materials in the presence of a solid acid catalyst in column 12, lines 19-47. Therefore, it would have been obvious to one of ordinary skill in the art

Art Unit: 1797

at the time of the invention to modify the method of Merk to utilize acetic acid or acetate to produce peracetic acid, as such is a conventionally known and commonly used chemical in the electrolytic synthesis of peracetic acid as exemplified by Tennakoon. Thus, the limitations of claims 1 and 5 are met with respect to Merk in view of Tennakoon.

Concerning claim 2, Merk also discloses that the aqueous solution of a peroxide used for the sterilizing/cleaning of the object is reused for electrolytic synthesis (column 12, lines 44-52). Claims 6 and 7 further requires that the distance between the gas cathode and the anode is from 1 mm to 50 mm. Although Merk in view of Tennakoon disclose a space between the cathode and the anode that is filled by a solid acid catalyst and a membrane, the reference does not disclose the exact distance between said anode and cathode. However, it would have been well within the purview of one of ordinary skill in the art to optimize the distance between the gas cathode and the membrane in order to maximize the electrolytic synthesis of peracetic acid. Only the expected results would be attained.

Response to Arguments

3. Applicant's arguments filed March 2, 2009 have been fully considered but they are not persuasive.

Applicant's principle arguments are:

a) Merk does not disclose or suggest the anode being in contact with the membrane. In addition, by selecting either a proton permeable membrane or an anion

Art Unit: 1797

exchange membrane for the barrier, the peracetic acid may be formed in either an alkaline electrolyte in the cathodic chamber or in an acid electrolyte in the anode chamber respectively. Furthermore, Tennakoon does not disclose or suggest using a particulate solid acid catalyst packed in the chambers for the purpose of catalytic reaction. Thus, one skilled in the art would not be motivated to modify the electrolytic cell of Merk to include the solid acid catalyst of Tennakoon because doing so would render Merk incapable of operating as originally intended (i.e. a two-chamber design permitting the option of forming peracetic in either an alkaline electrolyte in the cathodic chamber or in an acid electrolyte in the anode chamber).

Merk is not relied upon for the limitation concerning the membrane in contact with the anode. Tennakoon is relied upon for this limitation as set forth above.

With respect to the suggestion that Tennakoon does not disclose using a particulate solid acid catalyst packed in the chambers for the purpose of catalytic reaction, the reference specifically discloses that, "Peracids are typically produced by chemical synthesis as a result of mixing carboxylic acid and hydrogen peroxide with an inorganic acid catalyst in a reaction vessel. For example, peracetic acid is commercially produced by the reaction of hydrogen peroxide with acetic acid (or acetic anhydride) using concentrated sulfuric acid as a catalyst." See column 2, lines 40-45, wherein the reference continues to disclose that the aqueous catalyst is replaced by a solid catalyst (column 2, lines 59-61; column 4, lines 15-20). Therefore, Tennakoon does disclose a solid particulate catalyst packed in the chambers (Figures 1 and 2) for the purpose of a catalytic reaction.

Concerning the assertion that one skilled in the art would not be motivated to modify the electrolytic cell of Merk to include the solid acid catalyst of Tennakoon because doing so would render Merk incapable of operating as originally intended (i.e. a two-chamber design permitting the option of forming peracetic in either an alkaline electrolyte in the cathodic chamber or in an acid electrolyte in the anode chamber); different embodiments disclosed in Merk produce the peracetic acid in different chambers wherein the modification of the first embodiment as shown in Figure 1 of Merk would not render the apparatus inoperable for its intended purpose.

For example, Figure 1 of Merk is provided as an embodiment wherein a solid acid catalyst in conjunction with an anode and a cathode are utilized with a cation exchange membrane, which permits the migration of protons between chambers, but limits the migration of anions between the chambers; and also acts as a separation barrier between electrolytes in the two chambers. Merk also discloses that such a preferable membrane is NAFION 117 (column 4, lines 50-65). This particular embodiment produces peracetic acid in the cathodic chamber.

Tennakoon discloses an example wherein a solid acid catalyst in conjunction with an anode and cathode are utilized with a proton exchange membrane, which permits the migration of protons but limits the migration of anions and suggests that the preferable membrane is also NAFION 117 (column 7, lines 5-20). Thus, each utilize an electrolytic cell comprising a cathode, an anode, a solid acid catalyst and the exact same membrane for the formation of peracetic acid in the cathodic chamber. As such, a modification of the electrolytic cell of Merk (as shown as the embodiment in Figure 1)

Art Unit: 1797

to include the particular configuration of Tennakoon comprising a particulate solid acid catalyst comprising a polymer resin filling a space between the gas cathode and the membrane, wherein the anode is in contact with the membrane would operate as intended, wherein one of ordinary skill would be motivated in order to increase production rates of the aqueous solution and reduce the potential for introducing the toxic constituents as set forth in Tennakoon.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Art Unit: 1797

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEVIN C. JOYNER whose telephone number is (571)272-2709. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Elizabeth L McKane/
Primary Examiner, Art Unit 1797

KCJ